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**Setifikaat**

PATENTKANTOOR

DEPARTMENT VAN HANDERL  
NYWERHEID



**PCTZA 2004 / 00154**

**Certificate**

PATENT OFFICE

DEPARTMENT OF TRADE  
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The attached documents are true copies of the Form P2, P1, P6 and a Provisional Specification of a South African Patent application No. 2004/09654

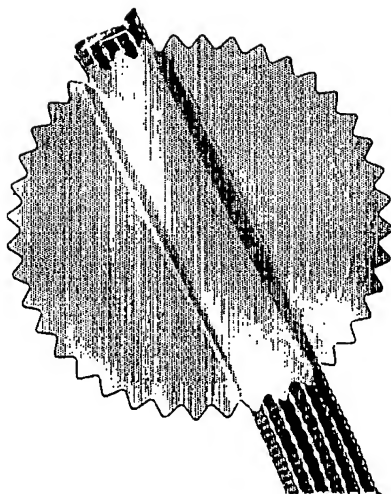
In the name of : **JAN PETRUS HUMAN**

Filed on the : **12<sup>th</sup> December 2003**

Entitled : **TAMPER EVIDENT CAP**

Geteken te **PRETORIA** in die Republiek van Suid-Afrika, hierdie **20<sup>th</sup>** dag van **DECEMBER 2006**  
Signed at in the Republic of South Africa, this day of

Registrateur van Patente  
Registrar of Patents



REPUBLIC OF SOUTH AFRICA				PATENTS ACT, 1978			
<b>REGISTER OF PATENTS</b>							
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51			23				47
FULL NAME(S) OF APPLICANT(S) / PATENTEE(S)							
71	JAN PETRUS HUMAN						
APPLICANTS SUBSTITUTED						DATE REGISTERED	
71							
ASSIGNEE(S)						DATE REGISTERED	
71							
FULL NAME(S) OF INVENTOR(S)							
72	JAN PETRUS HUMAN						
PRIORITY CLAIMED		COUNTRY		NUMBER		DATE	
		33	—	31	—	32	—
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54	TAMPER EVIDENT CAP						
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74							
PATENT OF ADDITION TO NO.			DATE OF ANY CHANGE				
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FRESH APPLICATION BASED ON			DATE OF ANY CHANGE				

REPUBLIC OF SOUTH AFRICA  
PATENTS ACT, 1978  
APPLICATION FOR A PATENT AND ACKNOWLEDGMENT OF RECEIPT  
(Section 30(1) Regulation 22)

THE GRANT OF A PATENT IS HEREBY REQUESTED BY THE UNDERMENTIONED APPLICANT  
ON THE BASIS OF THE PRESENT APPLICATION FILED IN DUPLICATE



21 01 OFFICIAL APPLICATION NO. 2003/9654

BB REF: 10417

71 FULL NAME(S) OF APPLICANT(S)

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54 TITLE OF INVENTION

TAMPER EVIDENT CAP

REGISTRAR OF PATENTS, DESIGNS,  
TRADE MARKS AND COPYRIGHT

2003 -12- 12

REGISTRATEUR VAN PATENTE, MOEDILLE,  
HANDELSMERKE EN OUIKURSTIC

☒ THE APPLICANT CLAIMS PRIORITY AS SET OUT ON THE ACCOMPANYING FORM P.2.  
(COUNTRY) (DATE) (NO.)

☐ 21 01 THE APPLICATION IS FOR A PATENT OF ADDITION TO PATENT APPLICATION NO

☐ 21 01 THIS APPLICATION IS A FRESH APPLICATION IN TERMS OF SECTION 37 AND BASED ON APPLICATION NO

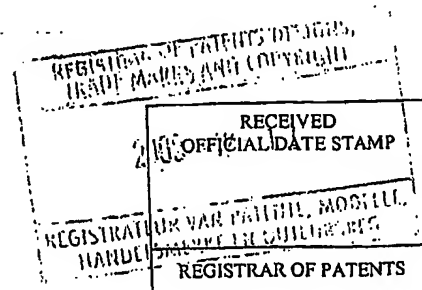
THIS APPLICATION IS ACCOMPANIED BY:

- ☒ 1. A single copy of a provisional or two copies of a complete specification of 6 pages
- ☒ 2. Drawings of 4 sheets
- ☐ 3. Publication particulars and abstract (Form P.8 in duplicate).
- ☐ 4. A copy of Figure of the drawings (if any) for the abstract.
- ☐ 5. An assignment of invention
- ☐ 6. Certified priority document(s). (State number)
- ☒ 7. Translation of the priority document(s)
- ☐ 8. An assignment of priority rights
- ☐ 9. A copy of Form P.2 and the specification of RSA Patent Application No
- ☒ 10. Form P.2 in duplicate
- ☒ 11. A declaration and power of attorney on Form P.3
- ☐ 12. Request for ante-dating on Form P.4
- ☐ 13. Request for classification on Form P.9
- ☐ 14.

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DATED THIS 11<sup>th</sup> DAY OF December 2003

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APPLICANTS PATENT ATTORNEYS  
The duplicate will be returned to the applicant's address for service as  
proof of lodging but is not valid unless endorsed with official stamp



BRIAN BACON & ASSOCIATES  
PATENT ATTORNEYS  
CAPE TOWN

REPUBLIC OF SOUTH AFRICA  
Patents Act, 1978

## PROVISIONAL SPECIFICATION

(Section 30 (1) – Regulation 27)

21	01	OFFICIAL APPLICATION NO
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22	LODGING DATE
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2003-12-12

... 2003/9654

71	FULL NAME(S) OF APPLICANT(S)
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JAN PETRUS HUMAN

72	FULL NAME(S) OF INVENTOR(S)
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JAN PETRUS HUMAN

54	TITLE OF INVENTION
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TAMPER EVIDENT CAP

### FIELD OF THE INVENTION

THIS INVENTION relates to tamper evident closures for containers such as bottles.

### BACKGROUND TO THE INVENTION

5           The most commonly used type of tamper evident threaded closure has a series of protrusions which project inwardly from a skirt and interlock with a bead of the container. The protrusions are on a band which forms part of the skirt and which is joined along a line of weakening to the remainder of the skirt. The band itself has a transverse line of weakening extending across it. It is intended that any  
10           attempt to remove the cap causes the band to break along its transverse line of weakening. However, it is possible with care to remove such a closure without damaging it, and then screw it back onto the bottle again without damaging it. It consequently does not reveal tampering.

          The present invention provides an improved tamper evident closure.

### BRIEF DESCRIPTION OF THE INVENTION

15           According to one aspect of the present invention there is provided a method of manufacturing a cap, the method comprising moulding the cap with a skirt which is subdivided by a circumferentially extending line of weakening into a main part and a band, at least the band being of heat shrinkable material.

The method of manufacturing can comprise moulding the cap and subsequently expanding the moulded band thereby to increase its diameter.

The band can be expanded mechanically by means of movable components of the mould, or can be subjected to air pressure which expands the band.

According to another aspect of the present invention there is provided a cap which comprises a transverse end wall and a cylindrical skirt, an end portion of the skirt being in the form of a band which is connected to the skirt along a line of weakening, the band being of heat shrinkable material.

According to a further aspect of the present invention there is provided a method of closing a container which comprises fitting a cap as defined above onto the container, and subjecting the band to heating to shrink it onto the container.

#### BRIEF DESCRIPTION OF THE DRAWINGS

For a better understanding of the present invention, and to show how the same may be carried into effect, reference will now be made, by way of example, to the accompanying drawings in which:-

Figure 1 is a section through a cap at an intermediate state in the moulding procedure;

Figure 2 is a similar section showing the cap at a later stage in the moulding

procedure;

Figure 3 is a pictorial view showing the cap being presented to a bottle for fitting;

Figure 4 is a pictorial view showing the cap on the bottle;

5 Figure 5 is a section, to a larger scale, showing the cap and bottle of Figure 4;

Figure 6 is a view similar to that of Figure 4 and showing the cap after heat treatment; and

Figure 7 is a section similar to that of Figure 5 and showing the cap after heat treatment.

# 10 DETAILED DESCRIPTION OF THE DRAWINGS

The cap 10 comprises a transverse end wall 14 and a skirt 16. The skirt has internal threading at 18 which matches external threading of the neck N (see Figures 5 and 7) of the bottle B.

15 The free end portion of the skirt 16 is in the form of a band 24. The band is joined to the remainder of the skirt by a series of circumferentially spaced bridges 26. The effect of this is to provide a circumferentially extending line of perforations 22 which alternate with the bridges 26. The line of perforations 22 is interrupted by a non-perforated zone 30 at which the band 24 is joined to the remainder of the skirt 16. The non-perforated zone 30 constitutes a bridge which is  
20 wider than the bridges 26.

The band 24 has a line of weakening 36 which extends from the free



edge thereof to the line of perforations 22. The line of weakening 36 can comprise a series of perforations or a line where the band 24 is of reduced thickness.

As will clearly be seen from Figures 5 and 7, the band 24 is thinner than the remainder of the skirt 16, and there is an internal step at 40 where the change in thickness occurs.

The cap is moulded with its band 24 tapering inwardly as shown in Figure 1. Before the cap is removed from the mould the band 24 is stretched so that it takes on the cylindrical configuration shown in Figure 2. This can be achieved either mechanically by means of parts of the mould which expand forcing the still soft band 24 outwardly or by applying air pressure. This latter method is a technique known as stretch blow moulding.

PET is the preferred material for the cap but any other shrinkable plastics material can be used.

If reference is now made to Figures 4 and 5, it will be seen that the cap 10 has been screwed onto the bottle B until the free edge of the band 38 is close to the flange F of the bottle. Movement of the cap 10 is limited by engagement between the bead Q and the step 40 where the main part of the skirt 16 of the cap merges with the band 24. Once the cap has been screwed onto the bottle B as shown in Figures 4 and 5, the capped bottle moves into a heat shrink tunnel. The main purpose of heating the bottle is to shrink the bottle's synthetic plastics material

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sleeve shaped label around the body of the bottle. The effect of the heat on the thin band 24 is to cause it to shrink back to the condition in which it was moulded (see Figure 1) which results in it tightly gripping the bottle between the bead and the flange (Figure 7).

5                    Experimental work has shown that the band 24, once it has shrunk onto the bottle, is brittle. Any attempt to prise the band 24 off the bottle causes it to fail along the weakened line 36 which extends across it.

10                    The cap is removed from the bottle by twisting it. The band 24, because it is a tight fit around the neck of the bottle, resists turning and the result is that the cap breaks along the line of weakening 36. The band 24 also breaks along the line of perforations 22 and either separates from the remainder of the cap entirely or remains attached to it by way of the zone 30 across which the line of perforations 22 does not extend. The fact that the cap has previously been removed from the bottle is evident because the band is either missing completely or is only  
15                    attached to the remainder of the cap at the zone 30 but broken along its axially extending line of weakening.

Dated this 11<sup>th</sup> day of December 2003

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Brian Bacon & Associates  
Applicant's Patent Attorney

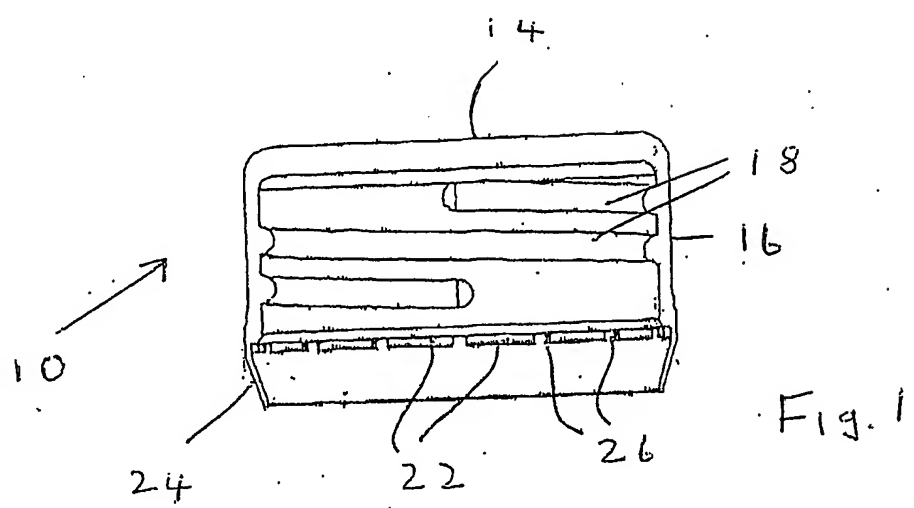


Fig. 1

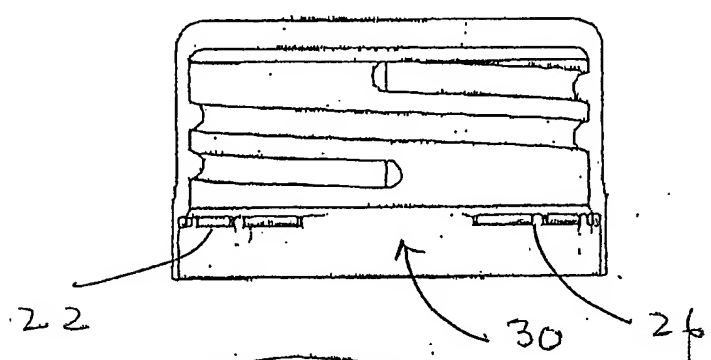


Fig. 2

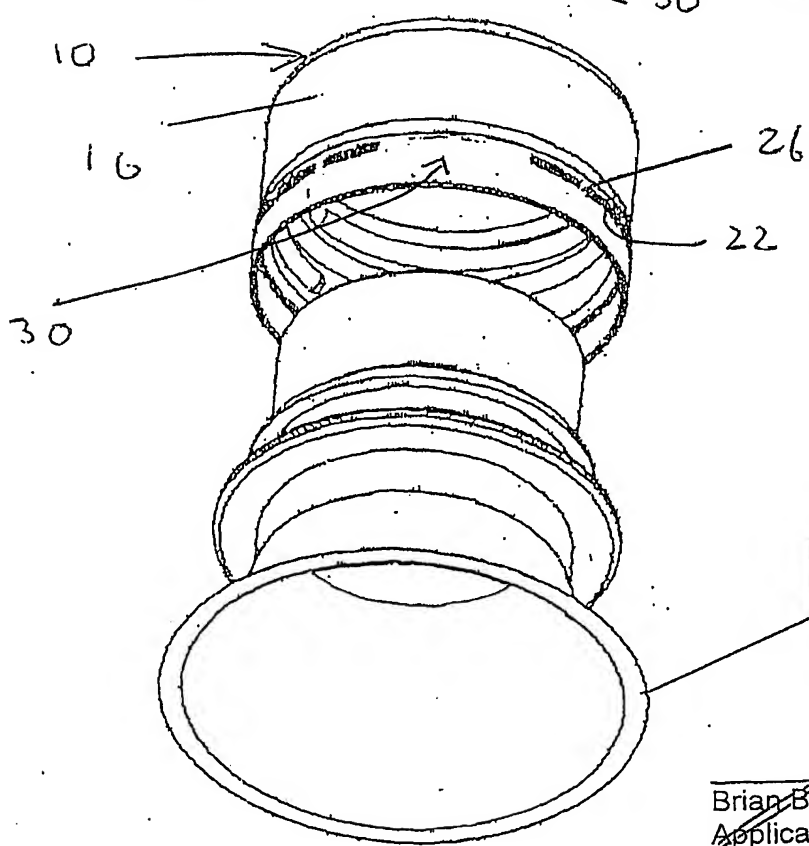


Fig. 3

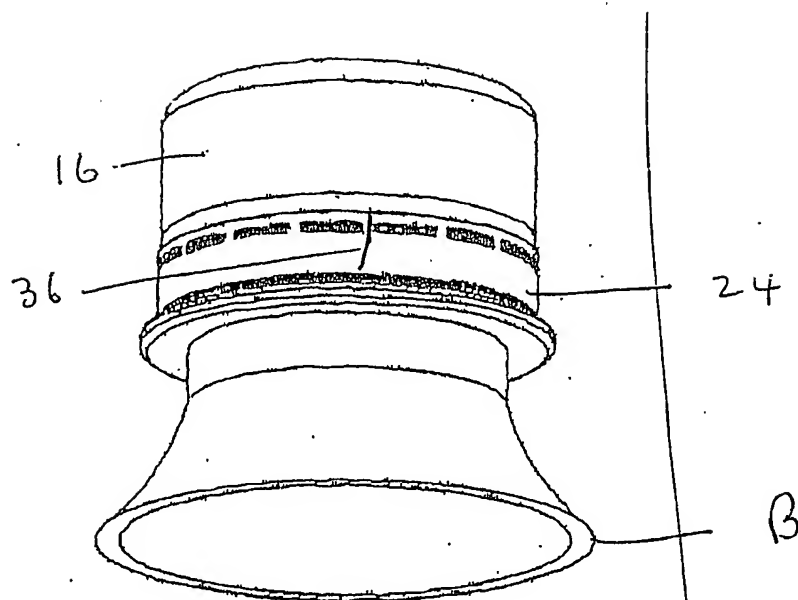
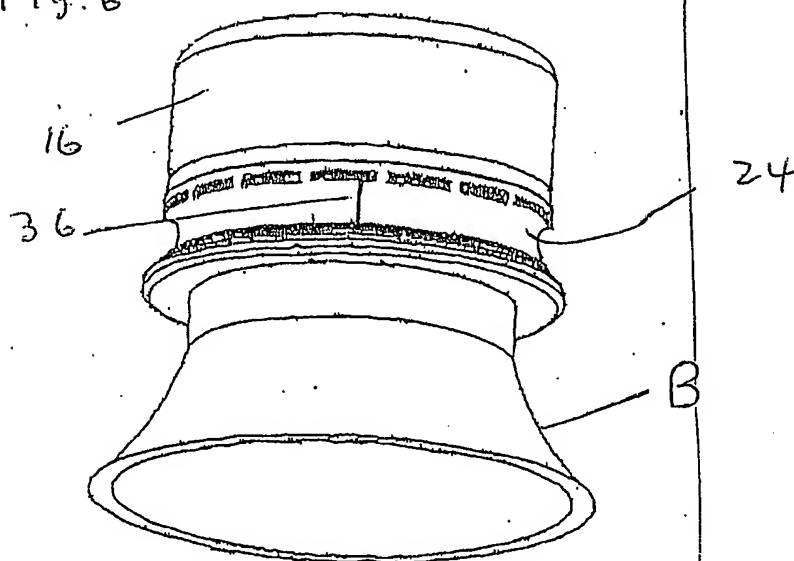
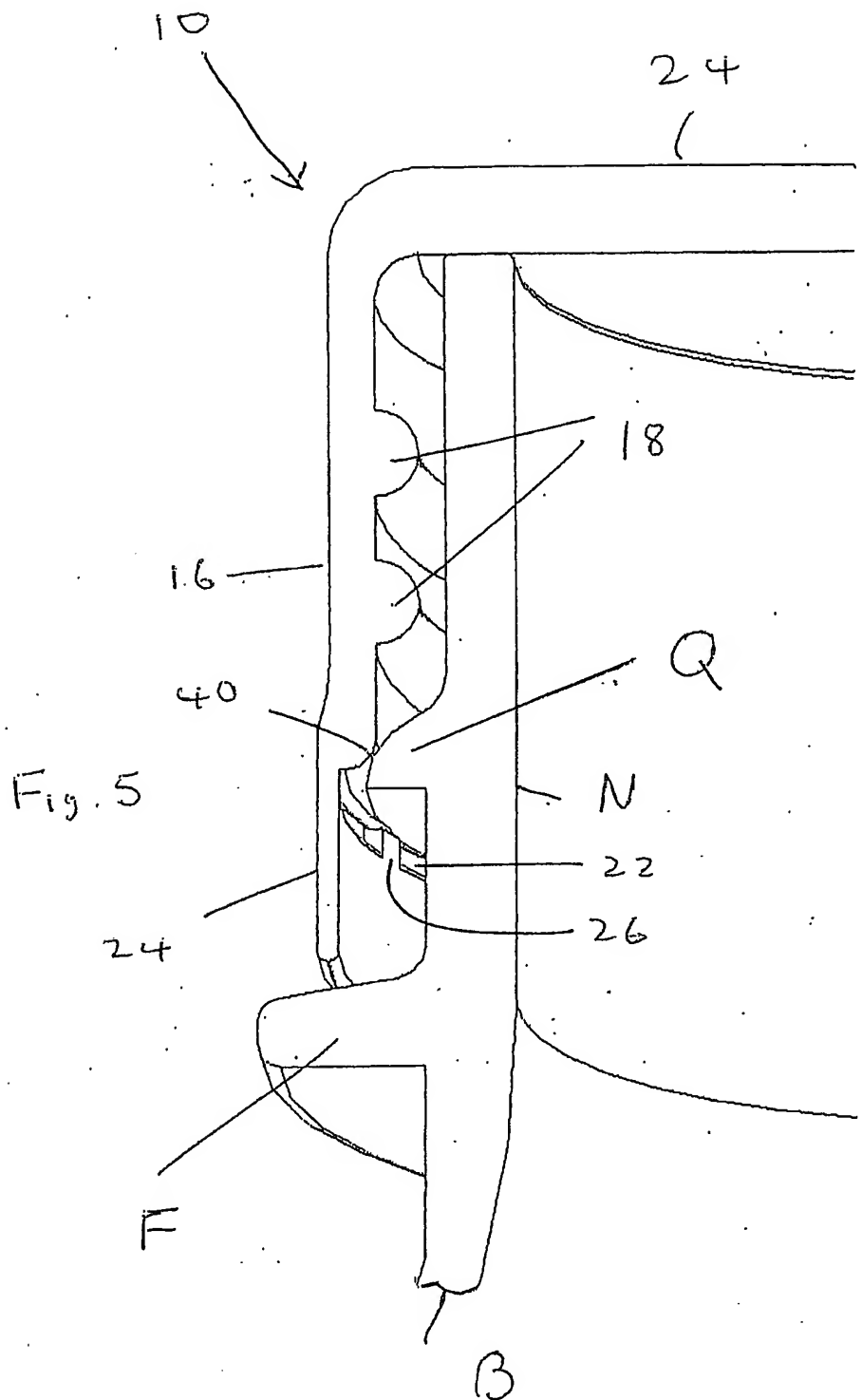


Fig. 4

Fig. 6



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